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ABSTRACT

The purpose of peer group identification is to objectively organize a large number of academic programs so the results might be used for administrative analysis and comparison. Data from teacher education programs in 76 public universities were analyzed using multi-stage statistical procedures. Data on 215 variables (e.g., average class size, by level, student-faculty ratio, faculty salaries, tuition) were reduced to 37 key indicators of resources and productivity. The factor scores for each teacher education program were used to produce a cluster analysis, which paired the programs by similarity, and yielded five clusters of programs. Three tests were used to verify the optimum fit of the programs within the clusters and the correct number of clusters. These follow-up procedures included analysis of variance, discriminant analysis, and classification analyses. Several suggestions are included for how deans of these programs could use the results for program and budget planning. (Author/JD)

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QUANTITATIVELY-BASED PEER PROGRAM IDENTIFICATION

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ABSTRACT

Academic deans annually negotiate for a fair share of university resources. Without quantitative accreditation standards to serve as minimum guidelines, the competition is more difficult. Peer institution comparison, derived from the analysis of quantitative data on resource and productivity variables, assists by providing less biased justification for budget requests. In this study, data from a national study of doctoral-granting teacher education programs was used for a factor analysis of key resource and productivity variables. Seven alternative cluster analysis methods were used and compared. Three follow-up procedures (Analysis of Variance, Discriminant Analysis, and Classification Analysis) tested the cluster analysis results to verify the differences between clusters and their internal homogeneity on three different cluster solutions. The classification analysis showed that 88.2 percent of the 76 programs were correctly classified on the five cluster solution produced using Ward's Minimum Variance Method. The practical use of such data suggests that Cattell's pattern of profile similarity is a useful beginning to compare programs on factor scores; following that, raw data on each key variable might be used to prepare individual program profiles for more specific comparison.

QUANTITATIVELY-BASED PEER PROGRAM IDENTIFICATION

The competition for a fair share of the budget resources is an annual challenge for academic deans. Accreditation requirements, as used for the professional schools of business administration, engineering, medicine, and nursing often include quantitative standards. These may be expressed as student: faculty ratios, support staff: faculty ratios, budgets for operating expenses and capital outlay per FTE faculty, or direct cost per academic year per FTE student by level; all are functions of budget resources. Accreditation may be jeopardized if these minimum standards are not maintained; academic administrators use that argument to justify budget requests.

Another rational and increasingly useful approach to planning and justification budget requests is comparison with peer institutions. The annual studies of engineering education (Hemp and Brunson, 1984) and teacher education (AACTE, 1983; Peseau, 1984; Peseau, 1986) provide comparative quantitative information on resources and productivity. The predominant attitude among deans and department heads, however, is that academic programs cannot be assessed by what Rivlin (1971) described as a "production function", and that such analysis debases efforts to attain quality. Teacher education programs, in particular, have frequently been criticized for their avoidance of resource adequacy issues (Berliner, 1984; Denton & Smith, 1983; Hawley, 1986; Nash & Ducharme, 1983; Peseau, 1988). Since

the resources available do influence the quality of academic programs (Bowen, 1981) and usually no a priori resource standards are known, much of the reference set for understanding the problem derives from analysis of historic and comparative data (Allen & Topping, 1979; Bowen, 1980; Halstead, 1974; Lawrence, Weathersby, & Patterson, 1970; Terenzini, Hartman, Lorang, & Shirley, 1980). Comparison of one program with others of perceived quality can provide useful solutions to that problem. Judgmental quality rankings of academic programs (Astin & Solmon, 1981; Blau & Marguiles, 1974-1975; Cartter, 1966; Roose & Anderson, 1970) have been methodologically criticized because they permit excessive rater bias (Fretter, 1977; Elton & Rose, 1972; Webster, 1981). More objective comparative ratings have been offered based on analysis of resource and productivity data (Brinkman & Teeter, 1987; Clark, Hartnett, & Baird, 1976; Davis & Astin, 1987; Elton & Rose, 1972; Lane, Lawrence, & Mertins, 1987; Terenzini, et al., 1980). The operational usefulness of peer program comparison requires that data be available, and that an objective identification of peer programs precedes the comparative analysis. This peer identification process does not preclude a comparison of one program with any others selected judgmentally; it merely provides a more unbiased beginning. If an academic program was found to be in a peer group less than desirable, analysis of data from programs of better perceived quality still would be possible, and perhaps more imperative.

Terenzini et al. (1980) stated that "such comparisons are intended to serve directly the university's planning, budgeting, and resource allocation processes." (p. 349).

Brinkman and Teeter (1987) described four orientations to peer program identification, from highly judgmental using panel or individual review to statistical analysis. Cluster analysis has been recommended as one defensible statistical method for peer program identification. This technique pairs programs by similarity or selected variables, then arranges them sequentially and suggests breaks in the sequence to form groups or clusters. This sorting is not necessarily in terms of relative quality, but instead on the homogeneity of characteristics as measured by the variables. However, the factors used in cluster analysis might include groups of variables which reflect higher resource levels and therefore infer better quality. Cluster analysis does not account for possible peer relationships influenced by other considerations, such as similar geographic location or competitive recruitment areas, although these are interesting judgmental variables which could be included with more quantitative information. The purpose of peer group identification is to objectively organize a large number of academic programs so the results then might be used for administrative analysis and comparison.

METHODOLOGY

Population

The Association of Colleges and Schools of Education in State Universities and Land-Grant Colleges (ACSESULGC) sponsored annual research on teacher education programs which offered studies through the doctoral level (Peseau, 1986). There were 111 such programs in public universities in 1985-1986. Seventy-seven of those programs reported their data which were used for this cluster analysis. These programs were from 42 states, with from one to six programs in a state. One institution was excluded from the analysis because of excessive missing data, and 76 programs were included in this study.

Variables

The 76 programs provided 220 data elements, organized into 30 concerning faculty, 150 for university and external budget allocations, 28 for credit hour production, and 12 for degrees awarded. From the data, 71 other variables were calculated (e.g., average class size by level; student: faculty and faculty: support staff ratios, average salaries by rank, an institutional complexity index, distribution of degrees awarded, and tuition as percent of undergraduate program direct cost). Similar research has been conducted annually for engineering education (Hemp & Brunson, 1984). Throughout the years of the teacher education studies, a panel of ACSESULGC deans had advised on the research. A restricted set of key resource and productivity indicators

had been consensually identified. Nineteen variables were selected for use in this study. The first nine represent resources and the remainder, productivity.

- Headcount total professors
- Academic year professor's salary
- Total FTE university-funded FTE personnel, fiscal year
- Total fiscal year FTE faculty for instructors
- Total fiscal year FTE graduate assistants
- Fiscal year total funds, university sources
- Fiscal year university funds, instructional salaries
- Funding from university sources per FTE faculty
- Funding from university sources per FTE faculty for operations
- Weighted credit hour productivity per FTE faculty
- Graduate 2 weighted credit hours as percent of total
- Institutional program complexity index
- Doctoral degrees as percent of total
- Cost per weighted semester credit hour
- Ratio of FTE faculty to FTE support personnel
- Ratio of FTE students to FTE instructional faculty
- Tuition as percent of cost
- Fiscal year weighted semester credit hours
- Total FTE students

Financial influences logically dominate the resource variables. Funding from university allocations only was used for all resource variables except one (total fiscal year FTE for instruction), where external funding support for instruction was reported by some programs. The productivity variables represent a diversity of output measures. The institutional complexity index is a value calculated from the number of credit hours produced by level, then differentially weighted (undergraduate times 1.04, graduate 1 (Master's) times 2.3 and post-Master's times 8.79). These are weights used in the Texas and Alabama higher education funding formulas. They are only about half as great as the weights assigned for engineering

and sciences. Credit hours from quarter-system universities were multiplied by .667 to convert to semester-system equivalents.

Within the 76 teacher education programs, four had one missing data point each. These were replaced by the mean value of the respective variables. Thus, of 1174 possible data points (19 variables times 76 programs), only four were supplied with the mean value.

Treatment Procedures

Four stages of data analysis were used to derive the clusters of teacher education programs. First, the nineteen variables were subjected to a correlation matrix to verify the high degree of relationship between size of budgets and resource and productivity variables. For example, there was a 0.8711 correlation between the headcount professors and total FTE personnel for the fiscal year variables; many other very strong relationships also were found. Second, a principal components analysis transformed the set of variables into a new set of composite variables that were orthogonal (uncorrelated) to one another. Aldenderfer and Blashfield (1984) explained that principal components analysis and factor analysis "can be used, to reduce the dimensionality of the data, thereby creating new, uncorrelated variables that can be used as raw data for the calculation of similarity between cases" (p. 21). Third, the data were subjected to a factor analysis. Since the defined variables were not unique, the components were

orthogonally rotated using Kaiser's varimax criterion, and standardized factor scores then calculated for each teacher education program on the rotated factors. Finally, a cluster analysis was performed on the factor scores. Seven cluster analysis methods were run in order to compare the results, and three tests then used to validate which of the four, five, or six cluster solutions was best.

RESULTS

Factor Analysis

Four factors resulted from the principal components analysis of the 19 resource and productivity variables for the 76 teacher education programs. Table 1 shows the content of the rotated factors and the percentage of the total variance explained by each. The four-factor solution accounted for approximately 78 percent of the total variance among the 19 variables. Seventeen of the variables loaded

Insert Table 1 about here

significantly only on one factor each, while the others loaded on two factors (i.e., they measured more than one theoretical dimension). The generally accepted and widely used criterion of 0.40 was used to denote significance in loading of variables on the four factors. This also enabled each of the variables to be included in the factors. All but one factor had at least three variables involved, which

is the general rule of thumb for factors (SAS Institute, 1985).

Factor 1 is obviously related to the size of these teacher education programs. The headcount professors and fiscal variables are aspects of "size". Of the nine resource variables, six loaded heavily on Factor 1. This implies that a cluster analysis done on factors derived from resource data alone would result in clusters based on the relative size of the programs. The other factors were more varied in their components and were more difficult to describe in a simple, yet complete, manner. The risks of labeling factors must be recognized.

Factor 2 consists of several variables (graduate 2 weighted credit hours as percent of total, institutional complexity index and total weighted credit hours produced) which suggest "advanced graduate orientation". Factor 3 variables infer a "financial emphasis". Higher average professor's salaries, a lower ratio of faculty to support staff, and more funds per FTE faculty for operations are manifestations of better program funding. Only two variables loaded on Factor 4, the highest of which was FTE students to FTE faculty. The other variable, doctoral degrees as a percent of total, loaded negatively on this Factor 4. This factor was labeled "predominantly undergraduate programs".

Cluster Analysis

The broad goal of cluster analysis was to represent the teacher education programs in as parsimonious a manner as possible within the context of interpretability (Hull and Nie, 1981). To achieve this goal, two procedures were employed. Instead of arbitrarily selecting one cluster analysis method, several were tested. These alternative cluster analysis techniques can produce differences in assignment of programs to clusters and in the suggested number of clusters. Seven methods were tested: Ward's Minimum Variance, Average Linkage, Centroid Hierarchical, Complete Linkage, McQuitty's Similarity, Median Hierarchical, and Single Linkage. Each was done in an iterative manner; each starts with 75 clusters (74 clusters with one program each and one cluster of the two programs most closely related), then continues by either adding one more program to an existing cluster, combining two programs to form a new cluster, or joining two existing clusters to form a larger cluster until a single complete cluster is achieved. The results of the seven methods suggested some differences in breaks between clusters.

The second procedure used to determine the optimal cluster structure for the programs involved manual inspection of the within-cluster compaction to identify sharp increases in the fusion coefficient. Table 2 shows the number of breaks suggested with each clustering method. Hand (1981) and Aldenderfer and Blashfield (1986) stated that a sharp jump

from one pairing of programs to another implies that two relatively dissimilar clusters have been merged; the number of clusters prior to that jump was the most probable solution.

Insert Table 2 about here.

Figures 1, 2, and 3 display maps the solutions obtained for the six, five, and four cluster results. These plots show the teacher education programs for Factors 1 and 2 only--the

Insert Figures 1, 2, and 3 about here

factors with the highest eigenvalues or relative importance. The numbers represent individual programs in the different cluster solutions. Although none of the solutions give an ideal demarcation between one cluster and another, general separation is observed. Since there was such great diversity among the 76 teacher education programs, as reflected by the range within the data for any variable, clear separation of clusters was not expected. Cluster 1 was the single exception to the fairly compact rule shown by the other clusters. On this one set of axes, Cluster 1 shows diverse pairs of factors which did not fit into a "circular" boundary as did the other clusters.

Testing the Clusters

Even after the cluster analysis is completed, the researcher still has lingering uncertainties about the quality of the product. Several follow-up methods for validating the results have been suggested (Aldenderfer & Blashfield, 1986; Hand, 1981; Terenzini et al., 1980). Although the value of such exercises has been questioned, they do constitute a worthwhile effort to help allay some of the limitations of confidence. For this study, the following three validation techniques were used.

Analysis of Variance

Univariate F -ratios were computed for each of the four factors to compare the between-cluster mean square to the within-cluster mean square (Table 3). The F statistic is a test of the differences between the clusters and not of the

Insert Table 3 about here

overall clustering procedure. The results indicated that each factor was useful in distinguishing between the clusters, with a $p < 0.001$ on each factor.

Discriminant Analysis

It must be acknowledged that the selection of the optimal number of clusters is, to some extent, subjective. Although seven clustering methods were explored, no definitive clue to the best number of clusters was clearly obvious.

Multiple discriminant analysis was used to verify the clusters, (Table 4) and the extent to which they were significantly different. This procedure is an

Insert Table 4 about here

interpretative aid to assess the homogeneity of the clusters selected (i.e., how much alike the members of the clusters are as opposed to how different each cluster is from one another). It also allows for confirmation of the correct number of clusters. The discriminant analysis was done for the four, five, and six cluster solutions. For each solution, significance at the <0.001 level was found. However, the test of homogeneity of within-covariance matrices examines the hypothesis that homogeneity exists. For the four and six cluster solutions the chi-square was only significant at the <0.100 level. This violation of the assumption of homogeneity indicated that those solutions were not as appropriate as the five cluster solution, which was selected for this study. The small lambda in Table 4 denotes high discrimination.

Classification Analysis

A classification analysis procedure was used to verify the placement of the teacher education programs within the clusters. The discriminant analysis provided a set of derived classification functions which were used to classify the original set of data (colleges of teacher education) to

determine how many were correctly classified using the resource and productivity variables.

The results are corroborated in the classification analysis shown in Table 5. Of the 76 colleges of teacher

Insert Table 5 about here

education, 67 (88.2%) were correctly identified. This compares favorably with prior probabilities of 20% (1/5) for each group. Terenzini, et al. (1980) noted in a similar study that, even though the use of classification analysis in this manner tends to produce inflated "correct classification" percentages, the results are a definite improvement over the 20% chance probabilities. In this study, the classification was perfectly accurate in two of the five clusters, but substantially less accurate for Cluster 3.

Cluster Arrangements

The arrangement of the teacher education programs in the five clusters is shown in Table 6, with their factor scores. A characteristic of cluster analysis is that once two programs are clustered, they will never be separated.

Insert Table 6 about here

The programs are listed in the order in which they were paired; the programs most proximate to one another are most similar, at least on those resource and productivity variables used for this study. Each cluster is, by definition, different from the others. Since there is some variability within each cluster, more specific information can be derived by inspection of the individual program factor scores.

Cluster 1 is characterized by being below average on all but the third factor: financial emphasis. Funding to support faculty, professor's salaries, and for program operations reflect this characteristic. Cost per weighted semester credit hour is higher--a key indicator of well-funded programs. These programs also tend to be below average in size, and in both undergraduate and advanced graduate orientation.

Cluster 2 includes only two teacher education programs, which are the largest in public universities. They are above average on all four factors. This group has the highest mean of the five clusters on three of the four factors, and is well above average on the other. Both programs are very large in size, as expressed by headcount faculty, budget resources, weighted semester credit hours produced, and FTE graduate students. Cluster 2 also has the highest score on Factor 3, financial emphasis. Professor's salaries are well above average, as are funds per FTE faculty for operations and total funds. Although the Factor 4 score, "predominantly undergraduate programs", also is the

highest of the five clusters for this group, their sheer size of their programs accounts for this. Accordingly, these two programs also score higher than average on the "advanced graduate orientation" factor. The large size of these two makes them substantially different from the other 74 teacher education programs.

The Cluster 3 programs are marginally below average on three of the four factors. They have the highest scores on Factor 2, advanced graduate orientation. A larger proportion of credit hours were produced at the advanced graduate level. Weighted credit hours productivity per FTE faculty is higher. A greater percentage of the total weighted credit hours are at the advanced graduate level. The program complexity index is higher, reflecting a lesser proportion of undergraduate program activity. Note, however, that the "cost per weighted credit hour" loaded negatively on Factor 2, contrary to the formula funding assumption that advanced graduate credit hour costs should be higher. In addition, students in Cluster 3 teacher education programs pay a greater share of the direct costs of their programs from tuition payments, and their universities pay for less of these costs. These programs also tend to be slightly smaller than average in size.

The 13 programs in Cluster 4 are below average in size and above average on the undergraduate orientation factor. These programs score lowest on Factor 3, financial emphasis. Since these are primarily undergraduate programs, lower

financial support is to be expected. Perhaps the lower financial support and cost of these Cluster 4 programs and the opposite findings for Cluster 1 programs confirms to some extent that the higher level-higher cost assumptions of formula funding actually are administratively applied at the operational level in public universities.

Cluster 5 is the largest in number and most diverse. As a whole, those programs are above average in size; however, a few are very small and a few are very large. They tend to be slightly below average on advanced graduate orientation and slightly above average on undergraduate orientation. These are relatively low cost programs.

PRACTICAL USE OF THE RESULTS

The objective of using peer group information is not to achieve more similarity among academic programs. Indeed, the diversity of American higher education is one of its strengths; it reflects the relative autonomy which universities and faculty enjoy to create and experiment with different curricula and delivery systems. More negatively, that autonomy also encourages what might be excessive administrative discretion in the internal allocation of state funds to support academics. Peseau (1988), for example, reported on an intrastate analysis of these teacher education programs. When credit hours are normalized to a standard weighted credit hour, the costs per weighted credit hour should have been reasonably similar; however, great differences were found.

Quantitative accreditation standards expressed as minimums do serve either to influence decisions about reasonable funding of academic divisions, or to force institutions to make hard choices about the continuation of programs which do not meet a profession's expectations for quality. Where such quantitative standards are not defined, deans must negotiate as best they can with the university administration. There is probably great unevenness in the success of such efforts. Comparisons with subjectively identified peer programs introduces substantial bias and uncertainties. Broad-based, detailed database analysis can contribute to comparison processes which are much more impartial.

For deans who want to compare their programs with others, the cluster analysis serves two useful purposes. First, it impartially identifies and groups programs by similarity on those variables for which data are available. Admittedly, other very important aspects might not be included. As an example, for doctoral granting programs research productivity is an obviously important mission, yet such data were not available. Analysis of the cluster analysis product such as derived in this study is a first step. A review of factor scores and even scores on each variable might follow. Cattell's pattern of profile similarity also may be helpful in the analysis of peer programs by comparing the elevation, scatter, and shape of the factor score patterns. Figure 4 shows an example, using the teacher

education programs in Cluster 1. Note the dissimilarity of the University of Alaska profile to the others, due to its very high salaries and costs. That program was the last one to be included in the clustering procedure.

Even more detailed understanding of comparability can be derived by examination of scores on each variable for each institution; these were reported in the original study (Peseau, 1986). Alternatively, a dean could identify programs of reputed high quality, and compare their factor patterns or even the raw data on selected variables. The subjective analysis and comparison of data from "high quality" programs could add to the dean's power of persuasion in budget negotiations.

The adequacy of resources to support academic programs and what was produced with those resources should be a central concern in academia. The institutional research function should contribute to that effort, with comparative information for both central administrators and academic deans. Administrators are generally not strictly accountable for how funds were spent in relation to how they were generated. In the absence of quantitative and comparative analysis, bias and even prejudice sometimes influences funding allocation decisions. Moreover, such discrepancies become compounded through time. Academic deans are obligated to get a fair share of the university's resources for their programs. Quantitative data and peer

group analysis can help in that difficult challenge, and "serve the university's planning, budgeting, and resource allocation processes" (Terenzini, et al., 1980, p. 349).

TABLE 1
VARIMAX ROTATED FACTOR LOADINGS (ONLY LOADINGS OF .40 OR GREATER REPORTED)

VARIABLE	F1 LARGE SIZE	F2 ADVANCED GRADUATE ORIENTATION	F3 FINANCIAL EMPHASIS	F4 PREDOMINANTLY UNDERGRADUATE ORIENTATION
Headcount Total Professors	.92			
Academic Year Professor's Salary			.73	
Total University-funded FTE Personnel for Fiscal Year	.95			
Total Fiscal year FTE for Instruction	.91			
Total Fiscal Year FTE Graduate Assistants	.71			
Fiscal Year Total Funds, University	.94			
Fiscal Year University Funds, Instruction Salaries	.93			
Funding from University Sources per FTE Faculty			.89	
Funding from University Sources for Operations per FTE Faculty			.77	
Weighted Credit Hour Productivity Per FTE Faculty		.89		
Graduate 2 Weighted Credit Hours as Percent of Total		.81		
Institutional Program Complexity Index		.88		
Doctoral Degrees as Percent of Total				-.67
Cost per Weighted Semester Credit Hour		-.80		
Ratio of FTE Faculty to FTE Support Personnel			.43	
Ratio of FTE Students to FTE Instructional Faculty		.43		.81
Tuition as Percent of Cost		.74		
Fiscal Year Weighted Semester Credit Hours	.76	.51		
Total FTE Students	.91			
Eigenvalues (Rotated)	6.383	4.111	2.592	1.791
% variance explained	33.6%	21.6%	13.6%	9.4%
Cumulative % variance explained	36.2%	55.2%	68.8%	78.2%

TABLE 2

MAJOR BREAKS IN CLUSTER SIZE

METHOD	NUMBER OF CLUSTERS
Ward's Minimum Variance	5 & 4, 4 & 3
Average Linkage	5 & 4
Centroid Hierarchical	5 & 4
Complete Linkage	6 & 5
McQuitty's Similarity	5 & 4
Median Hierarchical	6 & 5
Single Linkage	5 & 4, 4 & 3

TABLE 3

ANALYSIS OF VARIANCE RESULTS

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
Mean squares				
Between	8.63	7.53	12.21	5.87
Within	.57	.60	.38	.73
F Ratio	15.12	12.53	32.06	8.08
Degrees of Freedom	4, 71	4, 71	4, 71	4, 71
p	<.001	<.001	<.001	<.001

TABLE 4

RESULTS OF DISCRIMANT ANALYSIS

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Constant	-3.62	-17.48	-1.21	-2.73	-0.63
Factor 1	0.32	6.23	-0.37	-2.62	0.72
Factor 2	0.14	1.43	1.78	-0.21	-1.03
Factor 3	4.43	7.39	-0.22	-2.65	-0.90
Factor 4	-0.28	1.30	-0.90	1.26	0.07
Approx. F-Ratio			17.86	p < 0.001	
Wilks' Lambda			0.07	p < 0.001	

TABLE 5

RESULTS OF CLASSIFICATION ANALYSIS

ACTUAL GROUP	% CORRECTLY CLASSIFIED	CLASSIFIED GROUP				
		1	2	3	4	5
1 (n=11)	100.0	11	0	0	0	0
2 (n=2)	100.0	0	2	0	0	0
3 (n=19)	73.7	0	0	14	1	4
4 (n=13)	92.3	0	0	1	12	0
5 (n=31)	90.3	1	0	1	1	28
OVERALL	88.2	12	2	16	14	32

TABLE 6

CLUSTERS ARRANGEMENTS WITH FACTOR SCORES

COLLEGE	F1	F2	F3	F4
<u>CLUSTER 1 (n=11)</u>				
State Univ of New York/Buffalo	-.21	.37	1.63	-1.50
Univ of North Carolina/Chapel Hill	-1.04	.39	1.77	-.69
Univ. of Massachusetts	.14	-.26	.88	-.91
Univ. of Virginia	.09	-.04	1.16	-.75
Virginia Tech Univ.	.34	-.41	1.30	-.74
Univ. of Delaware	-1.18	-.14	1.40	.50
Ohio Univ.	-1.02	.22	1.48	.65
Pennsylvania State Univ.	.28	1.09	1.73	.67
Univ. of Iowa	.11	-.12	1.54	-.09
Oklahoma State Univ.	-.22	-.02	1.34	.50
Univ. of Alaska	-1.22	-2.75	3.95	.34
<u>CLUSTER 2 (n=2)</u>				
Univ. of Georgia	2.83	.82	1.12	.48
Ohio State University	2.51	1.06	2.89	2.83
<u>CLUSTER 3 (n=19)</u>				
Rutgers Univ.	-.70	1.09	1.01	-2.70
Univ. of Maryland	1.02	.10	-.22	-1.85
Univ of Pittsburg	1.39	.20	.08	-3.31
Univ. of Southern Mississippi	.09	.20	-.28	-.22
Univ. of Alabama	-.03	.24	-.29	-.52
Univ. of Cincinnati	.36	.26	-.18	-.65
Florida State Univ.	.13	.24	-.47	.11
Univ. of Kansas	.02	.23	-.76	.15
Univ. of Missouri/Columbia	.30	1.55	-.08	.40
Univ. of Houston	.48	.69	.28	.77
Univ. of Florida	.07	1.90	-.59	-.71
Univ. of Kentucky	-.28	.48	-.25	-1.55
Kansas State Univ.	-.18	.86	-.79	-.93
College of William and Mary	-1.51	.62	.03	-.77
Univ. of Oklahoma	-1.04	.69	-.02	-.63
Univ. of Nevada/Reno	-1.61	.79	-.17	-.22
Univ. of North Carolina/Greensboro	-1.29	2.89	.37	-.35
Univ. of Arizona	.12	2.45	.65	.38
Univ. of South Carolina	.09	3.81	-.52	.26

TABLE 6 (Cont.)

COLLEGE	F1	F2	F3	F4
<u>CLUSTER 4 (n=13)</u>				
State Univ. of New York/Potsdam	-1.14	-.87	-.85	1.00
Montana State Univ.	-.75	-1.20	-.95	.84
Univ. of Montana	-1.20	-.20	-1.74	1.61
Florida Atlantic Univ.	-.91	-.52	-1.06	.32
Univ. of Missouri/St. Louis	-.97	-.27	-.87	.13
Univ. of New Orleans	-.81	.00	-.98	.75
Univ. of Missouri/Kansas City	-.80	-.10	-1.51	-.11
Univ. of Maine	-1.47	.41	-.40	.68
Oregon State Univ.	-1.11	.96	-.31	.80
Univ. of Alabama/Birmingham	-.92	-.22	-.45	1.13
New Mexico State Univ.	-.89	-.34	-.09	.86
Univ. of Louisville	-.84	.08	.57	.99
Indiana Univ.	-1.40	.60	-.21	2.17
<u>CLUSTER 5 (n=31)</u>				
Virginia Commonwealth Univ.	-.45	-1.42	-1.42	.15
Univ. of Hawaii	.03	-1.76	.00	.21
Indiana State Univ.	.35	-1.04	-.63	-.76
Iowa State Univ.	.67	-1.65	-.12	-.56
Memphis State Univ.	.58	-.40	-.24	.20
Auburn Univ.	.36	-.59	-.59	.22
Univ. of Wisconsin/Milwaukee	-.16	-.51	-.41	.47
Utah State Univ.	-.17	-.46	-.21	.76
Univ. of Arkansas	.07	-.83	-.09	.52
Colorado State Univ.	-.04	-.88	-.85	.35
Univ. of South Florida	.56	-.83	.43	.95
Miami University of Ohio	.84	-1.34	.85	.79
Georgia State Univ.	1.39	-.49	1.09	.56
North Carolina State Univ.	-.24	-.54	-.16	-.88
Washington State Univ.	-.84	-1.00	.15	-.87
Wayne State Univ.	-.35	-.08	.47	-.59
Texas Tech Univ.	-.60	-.61	-.25	.04
Univ. of Wyoming	-.46	-.40	-.26	-.28
Univ. of Nevada/Las Vegas	-1.01	-1.12	-.76	-.66
University of Washington	-.50	-.76	-.00	-2.04
Univ. of Tennessee	1.56	-1.13	-.96	-.79
Northern Illinois Univ.	2.30	-.95	-.89	-.16
Univ. of Texas/Austin	1.93	.41	-.76	.15
West Virginia Univ.	.32	.15	-1.13	.28
East Texas State Univ.	.90	.25	-.85	.05
Univ. of New Mexico	-.89	-.34	-.09	.86
North Texas State Univ.	1.44	-.01	-1.23	-.18
Louisiana State Univ.	.54	-.12	-1.09	-.45
Univ. of Nebraska	1.11	-.09	-.56	-.56
Southern Illinois Univ.	2.07	.05	-.76	1.05
Texas A&M Univ.	1.28	.58	-.96	2.18

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